

What is claimed is:

Claims

1. A method comprising the steps of:

determining when a key-on ignition condition for an internal combustion engine occurs;

determining a temperature for a first electronic component;

when the temperature for the first electronic component exceeds a temperature condition, reducing pre-cycle warm-up for a second electronic component.

2. The method of claim 1, wherein the second electronic component is one of a fuel injector coil and a glow plug.
3. The method of claim 1, further comprising the step of reducing pre-cycle warm-up for at least a third electronic component, wherein the second electronic component is not the third electronic component, and wherein the first electronic component drives the second electronic component and the first electronic component does not drive the third electronic component.
4. The method of claim 1, further comprising the step of allowing the internal combustion engine to crank without waiting for pre-cycle warm-up upon determining that the temperature of the electronic component exceeds the temperature condition.
5. The method of claim 1, wherein the first electronic component is utilized to drive the second electronic component.
6. The method of claim 1, further comprising the steps of:
when the temperature of the electronic component does not exceed the temperature condition, completing pre-cycle warm-up for the electronic component;
allowing the engine to crank.
7. The method of claim 1, wherein the temperature condition is a temperature differential between the temperature for the first electronic component and a temperature of something other than the first electronic component.

8. The method of claim 1, wherein the temperature condition is a temperature differential between the temperature for the first electronic component and one of ambient temperature, oil temperature for the internal combustion engine, and coolant temperature for the internal combustion engine.

9. The method of claim 1, wherein the temperature condition is an absolute temperature.

10. The method of claim 1, wherein the step of reducing pre-cycle warm-up comprises the step of reducing pre-cycle warm-up time to a non-zero time.

11. The method of claim 1, wherein the step of reducing pre-cycle warm-up comprises the step of temporarily inhibiting pre-cycle warm-up.

12. The method of claim 1, wherein the step of reducing pre-cycle warm-up comprises the step of reducing pre-cycle warm-up current to a non-zero current.

13. The method of claim 1, wherein the temperature condition falls between a temperature condition when the second electronic component is warm and a temperature condition below which the second electronic component is damaged.

14. The apparatus of claim 1, wherein pre-cycle warm-up for the second electronic component is reduced by a first amount at a first temperature condition of a plurality of temperature conditions and wherein pre-cycle warm-up for the second electronic component is reduced by a second amount at a second temperature condition of the plurality of temperature conditions.

15. An apparatus comprising:

a driver capable of driving an electronic component; ✓
a temperature sensor arranged and constructed to determine a temperature of the driver;
a driver controller, arranged and constructed to control the driver, to receive the temperature of the driver, and when the temperature of the driver exceeds a temperature condition, to reduce pre-cycle warm-up of the electronic component.

16. The apparatus of claim 15, wherein the electronic component is one of a fuel injector coil and a glow plug.

17. The apparatus of claim 15, wherein the temperature sensor is built-in to the driver.

18. The apparatus of claim 15, wherein the temperature sensor is disposed on the driver.

19. The apparatus of claim 15, wherein the driver controller is further arranged and constructed to complete pre-cycle warm-up of the electronic component when engine crank is detected and the temperature of the driver does not exceed the temperature condition.

20. The apparatus of claim 15, wherein the temperature condition is a temperature differential between the temperature for the electronic component and a temperature of something other than the electronic component.

21. The apparatus of claim 15, wherein the temperature condition is an absolute temperature.
22. The apparatus of claim 15, wherein the driver controller reduces pre-cycle warm-up by reducing pre-cycle warm-up time to a non-zero time.
23. The apparatus of claim 15, wherein the driver controller reduces pre-cycle warm-up by temporarily eliminating pre-cycle warm-up.
24. The apparatus of claim 15, wherein the driver controller reduces pre-cycle warm-up by reducing pre-cycle warm-up current to a non-zero current.
25. The apparatus of claim 15, wherein the driver controller is further arranged and constructed to reduce pre-cycle warm-up for one or more electronic components not controlled by the driver when the temperature of the driver exceeds a controller temperature condition.
26. The apparatus of claim 15, wherein the temperature condition falls between a temperature condition when the second electronic component is warm and a temperature condition below which the second electronic component is damaged.
27. The apparatus of claim 15, wherein pre-cycle warm-up for the second electronic component is reduced by a first amount at a first temperature condition of a plurality of temperature conditions, and wherein pre-cycle warm-up for the second electronic component is reduced by a second amount at a second temperature condition of the plurality of temperature conditions.